High Blood Pressure and Kidney Disease

National Kidney and Urologic Diseases Information Clearinghouse

National Institute of Diabetes and Digestive and Kidney Diseases

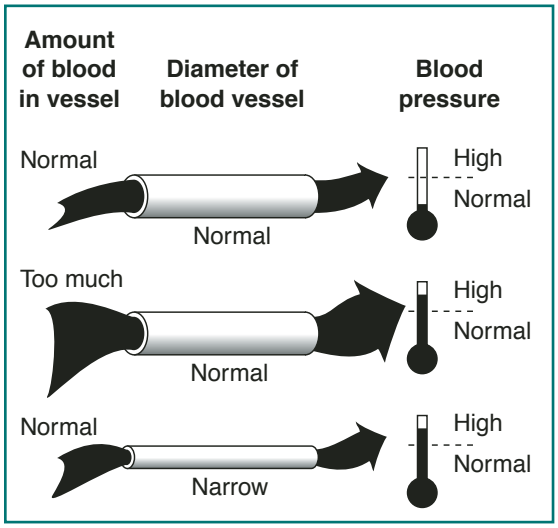
NATIONAL INSTITUTES OF HEALTH

Your kidneys play a key role in keeping your blood pressure in a healthy range, and blood pressure, in turn, can affect the health of your kidneys. High blood pressure, also called hypertension, can damage the kidneys.

What is high blood pressure?

Blood pressure measures the force of blood against the walls of your blood vessels. Blood pressure that remains high over time is called hypertension. Extra fluid in your body increases the amount of fluid in your blood vessels and makes your blood pressure higher. Narrow or clogged blood vessels also raise your blood pressure.

If you have high blood pressure, see your doctor regularly.



Hypertension can result from too much fluid in normal blood vessels or from normal fluid in narrow blood vessels.

How does high blood pressure hurt my kidneys?

High blood pressure makes your heart work harder and, over time, can damage blood vessels throughout your body. If the blood vessels in your kidneys are damaged, they may stop removing wastes and extra fluid from your body. The extra fluid in your blood vessels may then raise blood pressure even more. It's a dangerous cycle.

High blood pressure is one of the leading causes of kidney failure, also commonly called end-stage renal disease (ESRD). People with kidney failure must either receive a kidney transplant or go on dialysis. Every year, high blood pressure causes more than 25,000 new cases of kidney failure in the United States.

How will I know whether I have high blood pressure?

Most people with high blood pressure have no symptoms. The only way to know whether your blood pressure is high is to have a health professional measure it. The result is expressed as two numbers. The top number, which is called the systolic pressure, represents the pressure when your heart is beating. The bottom number, which is called the diastolic pressure, shows the pressure when your heart is resting between beats. Your blood pressure is considered normal if it stays below 120/80 (expressed as "120 over 80"). People with a systolic blood pressure of 120 to 139 or a diastolic blood pressure of 80 to 89 are

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considered prehypertensive and should adopt health-promoting lifestyle changes to prevent diseases of the heart and blood vessels. If your systolic blood pressure is consistently 140 or higher or your diastolic pressure is 90 or higher, you have high blood pressure and should talk with your doctor about the best ways to lower it.

How will I know whether I have kidney damage?

Kidney damage, like hypertension, can be unnoticeable and detected only through medical tests. Blood tests will show whether your kidneys are removing wastes efficiently. Your doctor should order tests to measure your serum creatinine. Having too much creatinine in your blood is a sign that you have kidney damage. The doctor should use the serum creatinine to estimate the main kidney function called glomerular filtration rate, or GFR.

Another sign is *proteinuria,* or protein in your urine. Proteinuria has also been shown to be associated with heart disease and damaged blood vessels. (For more information, see the fact sheet *Proteinuria* from the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK).)

How can I prevent high blood pressure from damaging my kidneys?

If you have kidney damage, you should keep your blood pressure below 130/80. The National Heart, Lung, and Blood Institute (NHLBI), one of the National Institutes of Health (NIH), recommends that people with kidney disease use whatever therapy is necessary, including lifestyle changes and medicines, to keep their blood pressure at or below 130/80.

Are there medicines that can help?

Many people need medicine to control high blood pressure. Two groups of medications called ACE (angiotensin-converting enzyme) inhibitors and ARBs (angiotensin receptor blockers) lower blood pressure

How can I control my blood pressure?

NHLBI has found that five lifestyle changes can help control blood pressure:

- Maintain your weight at a level close to normal. Choose fruits, vegetables, grains, and low-fat dairy foods.
- Limit your daily sodium (salt) intake to 2,000 milligrams or lower if you already have high blood pressure. Read nutrition labels on packaged foods to learn how much sodium is in one serving. Keep a sodium diary.
- Get plenty of exercise, which means at least 30 minutes of moderate activity, such as walking, most days of the week.
- Avoid consuming too much alcohol. Men should limit consumption to two drinks (two 12-ounce servings of beer *or* two 5-ounce servings of wine *or* two 1.5-ounce servings of "hard" liquor) a day. Women should have no more than a single serving on a given day because metabolic differences make women more susceptible to the effects of alcohol.
- Limit caffeine intake.

and have an added protective effect on the kidney in people with diabetes. Additional studies have shown that ACE inhibitors and ARBs also reduce proteinuria and slow the progression of kidney damage in people who do not have diabetes. You may need to take a combination of two or more blood pressure medicines to stay below 130/80. Your doctor may also prescribe a diuretic in addition to your ACE inhibitor or ARB. Diuretics are also called "water pills" because they help you urinate and get rid of excess fluid in your body.

What groups are at risk for kidney failure related to high blood pressure?

All racial groups have some risk of developing kidney failure from high blood pressure. African Americans, however, are more likely than Caucasians to have high blood pressure and to develop kidney problems from it—even when their blood pressure is only mildly elevated. In fact, African Americans are four times more likely than Caucasians to develop hypertension-related kidney failure.

People with diabetes also have a substantially increased risk for developing kidney failure. People who are at risk both because of their race and because of diabetes should have early management of high blood pressure.

The National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK), also part of NIH, sponsored the African American Study of Kidney Disease and Hypertension (AASK) to find effective ways to prevent high blood pressure and kidney failure in this population. The results, released in 2003, showed that an ACE inhibitor was better at slowing the progression of kidney disease in African Americans than either of two other drugs.

Hope Through Research

In recent years, researchers have learned a great deal about kidney disease. NIDDK sponsors several programs aimed at understanding kidney failure and finding treatments to stop its progression.

NIDDK's Division of Kidney, Urologic, and Hematologic Diseases supports basic research into normal kidney function and the diseases that impair normal function at the cellular and molecular levels, including diabetes, high blood pressure, glomerulonephritis, and polycystic kidney disease.

For More Information

American Kidney Fund
6110 Executive Boulevard
Rockville, MD 20852
Phone: 1–800–638–8299 or 301–881–3052
Email: helpline@kidneyfund.org
Internet: www.kidneyfund.org

National Heart, Lung, and Blood Institute Information Center
P.O. Box 30105
Bethesda, MD 20824–0105
Phone: 301–592–8573
Email: nhlbiinfo@nhlbi.nih.gov
Internet: www.nhlbi.nih.gov

National Kidney Foundation
30 East 33rd Street
New York, NY 10016
Phone: 1–800–622–9010 or 212–889–2210
Email: info@kidney.org
Internet: www.kidney.org

National Kidney and Urologic Diseases Information Clearinghouse

3 Information Way
Bethesda, MD 20892–3580
Phone: 1–800–891–5390
Fax: 703–738–4929
Email: nkudic@info.niddk.nih.gov
Internet: www.kidney.niddk.nih.gov

The National Kidney and Urologic Diseases Information Clearinghouse (NKUDIC) is a service of the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK). The NIDDK is part of the National Institutes of Health under the U.S. Department of Health and Human Services. Established in 1987, the Clearinghouse provides information about diseases of the kidneys and urologic system to people with kidney and urologic disorders and to their families, health care professionals, and the public. The NKUDIC answers inquiries, develops and distributes publications, and works closely with professional and patient organizations and Government agencies to coordinate resources about kidney and urologic diseases.

Publications produced by the Clearinghouse are carefully reviewed by both NIDDK scientists and outside experts. This fact sheet was also reviewed by Vito M. Campese, M.D., University of Southern California, and Matthew Weir, M.D., University of Maryland.

This fact sheet is also available at *www.kidney.niddk.nih.gov.*

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